NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

LAND RECONSTRUCTION, ABANDONED MINED LAND

(Acre)

CODE 543

DEFINITION

Restoring land and water areas that are adversely affected by past mining practices and increasing the productivity of the areas for a beneficial use.

PURPOSES

- Stabilize mined areas so that they can be used to support desirable vegetation
- Reduce erosion and sedimentation
- Enhance water quality or quantity
- Maintain or improve the visual quality of the landscape
- Protect public health, safety, and general welfare

CONDITIONS WHERE PRACTICE APPLIES

On abandoned mined land that degrades the quality of the environment, prevents or interferes with the beneficial use of land or water resources, or endangers the health or safety of individuals.

The standard applies to the construction, grading, and reshaping of land that has been disturbed or adversely affected by past mining of all minerals and commodities.

CRITERIA

General Criteria Applicable to All Purposes

This practice shall conform to all federal, state, and local laws, rules, and regulations. Laws, rules, and regulations of particular concern include those involving mining and reclamation, water rights, land use, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.

Land reconstruction on abandoned mined lands shall include the components necessary to reclaim and stabilize the area and prevent further degradation of air, water, soil, and plant resources. The system may consist of Conservation Practice Standard 455, Toxic Discharge Control, and traditional practices such as terraces, grade stabilization structures, and critical area treatment components, as appropriate.

An adequate water disposal system is to be installed for surface runoff. The erodibility of the mine spoil should be determined and a more intensive water disposal system used if it is highly erodible. Grade stabilization structures and lined waterways may be needed to provide a stable grade and prevent gullying. The water disposal system shall be installed along with the land shaping (where feasible) to minimize costs and problems in installation.

Site preparation. Areas to be graded shall be cleared of trees, logs, brush, rubbish, and other undesirable materials that can prevent proper application of the practice. These materials shall be disposed of in a manner that precludes interference with water disposal practices, stabilization operations, or the operations associated with the planned use of the land.

Unsuitable soil material must be removed and buried so that it does not adversely affect water quality or plant growth. These materials must be disposed of in a manner that minimizes the potential for seepage that can pollute surface and ground water. Materials containing heavy metals must be buried to a depth below the root

zone, or suitable kinds and amounts of soil amendments must be added.

Overhanging rocks and walls that are to be covered shall be sloped to ½ horizontal to 1 vertical (½:1) slope before the soil is placed against the wall, unless a flatter slope is needed for stability. Unless otherwise specified, fill material shall be spread in successive layers not more than 2 feet thick.

Removal and placement of material for final cover. Any soil material on the site that is suitable for the intended final use shall be salvaged, stockpiled, and protected for use as final cover material.

The reconstructed soil must meet the requirements for the specified land use on at least 80 percent of the area. The rest of the area must be in such a condition that it can be stabilized.

The salvaged material and other suitable materials must be spread over the graded areas to the depth specified in the reclamation plan. The final slope must permit application of needed conservation and management practices to keep soil losses within planned permissible levels. If settlement is likely to interfere with the planned use of the land, surface drainage, or water disposal, allowances must be made for the expected settlement during final grading.

Temporary seeding, mulching, water disposal, and similar measures to help control erosion should be used as necessary.

Water disposal. The need for a water disposal system shall be carefully analyzed, and if needed, it shall be included in the design. The system must be intensive enough to control erosion during and after stabilization. If any practices are to be removed after vegetation is established, provisions must be made to promptly stabilize all disturbed areas. Water disposal systems suitable for intensively farmed cropland are usually required for mined land reclamation and may be used as a guide in the absence of local experience.

Establishment. Due to the nature of mine reclamation work, it is not always possible to achieve complete stabilization with the first effort. Provisions shall be made to:

- Promptly fill and vegetate areas of excessive settlement
- Repair and revegetate bare spots and eroded areas
- Add soil amendments to achieve the physical or chemical soil conditions suitable for plant growth or replace with suitable soil materials
- Add plant nutrients to achieve acceptable plant development
- Install additional structural measures needed such as terraces, lined waterways, and grade stabilization structures

Restoration of borrow area. If cover material is taken from outside the reclamation site, the borrow area must be graded and reshaped to ensure proper drainage and be revegetated to control erosion.

If the cover material is taken from adjacent land, the topsoil from the borrow area must be stockpiled separately and replaced after the borrow area is restored for its intended purpose.

If the borrow area is prime farmland, the A and B horizons (or the B and C horizons if applicable) must be removed and stockpiled separately by horizon and then replaced on the borrow area in natural sequence. The combined thickness of the replaced horizons shall be adequate to restore the original soil productivity. Treatment of the borrow area shall meet the requirements of Conservation Practice Standard 544, Land Reconstruction, Currently Mined Land.

Additional Criteria to Maintain or Improve the Visual Quality of the Landscape

The appearance of the reclaimed site must be in accordance with standards for maintaining and improving the visual quality of the landscape and must be compatible with the adjacent landscape. Areas of high public visibility or those offering direct or indirect human benefits shall be evaluated and considered in landscape resource management planning and design. Soil piles and borrow areas shall be shaped to blend with the adjacent landscape as much as possible.

Additional Criteria to Protect Public Health, Safety, and General Welfare

Provisions must be made to reduce potential safety hazards and erosion and water pollution problems in areas that have highwalls, mine shafts, cave-ins, and sinkholes. Treatment shall meet or exceed the requirements of Conservation Practice Standard 456, Land Reclamation, Highwall Treatment.

CONSIDERATIONS

A detailed soil survey should be made of the area to be reclaimed and the proposed borrow area to identify the types and extent of soil materials.

Consider the need for access roads that would facilitate final reclamation activities and operation and maintenance.

Reclamation has great potential for increasing or improving wildlife habitat in the reclaimed area. Avoid monocultures when developing vegetative specifications.

A special concern is the potential for uncovering or redistributing toxic materials from earthmoving activities.

PLANS AND SPECIFICATIONS

Plans and specifications for reconstructing abandoned mined land shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

SPECIFICATIONS GUIDE

Land clearing. Where necessary for practice application, areas to be graded shall be cleared of trees, logs, stumps, brush, and other undesirable vegetation. These materials shall be disposed of in a manner that precludes interference with water disposal practices or the operations associated with the planned use of the land. Refer to Construction Specifications 460, Land Clearing.

Boulders and other rocks shall be covered to the depth specified for the planned use or otherwise placed where they present minimum interference with stabilization and planned use. Abandoned equipment and other similar type materials shall be buried or placed in applicable landfills or salvage yards.

Land shaping. Materials suited to growing vegetation shall be salvaged and protected for use as final cover. Vegetation that can be saved should be properly identified and protected. Temporary seeding, mulching, water disposal, and similar measures to help control erosion should be the used as necessary.

After major earthmoving is completed, the cover material should be spread over the surface. The work shall be finished according to the design and to the tolerances specified in the plans.

If borrow material from areas outside the reclamation site is used, these areas must be reshaped and left as specified or shown in the construction plans.

Where practical, highwalls will be shaped to a final slope of 2½:1 or a flatter slope where additional stability is needed. The desired slope will be obtained by backfilling, shaping, grading, or a combination of these practices. Unless otherwise specified, fill material shall be spread in successive layers not more than 2 feet thick.

When the planned land use is cropland, pastureland, recreation land, hayland, or rangeland, slopes shall not exceed 10 percent on 90 percent of the reconstructed area. A maximum slope of 15 percent will be allowed on the remaining 10 percent of the reconstructed area. Slopes shall not exceed 25 percent on land planned for wildlife, recreation, and woodland. Flatter slopes may be planned as needed to be compatible with the surrounding areas, provided adequate drainage is accomplished.

Slopes other than the highwall slopes leading into pits that contain permanent water will be shaped or graded to 25 percent slopes or flatter to allow for the establishment of permanent vegetation. Areas of land uses requiring flatter slopes will not be included for determining final field grades.

After shaping has been completed, final preparation will include one or more diskings with a heavy offset disk and dragging with a heavy steel beam.

Water treatment. All water in pits that is to be pumped from the area and released into intermittent or permanent streams will meet water quality standards. Water not meeting acidity, alkalinity, heavy metals, pH, suspended solids, and total dissolved solids requirements will be treated to meet water quality standards before being released.

OPERATION AND MAINTENANCE

A plan shall be prepared that provides specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The maintenance and operation plan shall specify procedures for:

- Filling areas where settlement may adversely affect drainage and land use
- Promptly repairing and re-vegetating bare spots and eroded areas
- Adding soil amendments to soils that cannot support adequate vegetation or replacing them with suitable soil material
- Maintaining access roads
- Keeping drainage structures and channels clean and functional
- Applying fertilizer and lime
- Controlling weeds
- Using proper grazing practices
- Controlling vehicular traffic
- Needed measures for wildlife and recreation